R E M A R K S

1. Reconsideration and further prosecution of the above-identified application are respectfully requested in view of the discussion that follows. Claims 11-30 are pending in this Application.

Claims 16-19 have been rejected under 35 U.S.C. §112, second paragraph. Claims 11-30 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,333,200 to Cooper et al. (Cooper '200). After a careful review of the claims (as amended), it has been concluded that the rejections are in error and the rejections are, therefore, traversed.

2. Claims 16-19 have been rejected under 35 U.S.C. §112, second paragraph. In response, claims 16 and 17 have been corrected.

3. Claims 11-30 have been rejected as being obvious over Cooper et al. In this regard, the Examiner has identified (from the Cooper '200 patent) the steps of crosstalk cancellation in Fig. 1c ("second transfer function matrix") and the "inverse formatter" or head simulator Fig. 8b ("first transfer function matrix"). These steps are shown in Fig. 10, first in 10a as separate blocks and then in 10b as combined into one block.

The Examiner asserts that this is for the purpose of presenting the recreated binaural impression to a "plurality" of listeners. This is incorrect, since the sections in the Cooper '200 patent, which are referenced, say nothing about more than one listener in the playback space. Indeed, the specification of the Cooper '200 patent is for only one listener in the playback space, in that the Cooper '200 patent and the other patents of

Cooper and Bauck referenced therein are directed to the issue of how to make that one listener have a better experience.

The Examiner asserts that the Cooper '200 patent involves "...solving for a transfer function matrix (Fig. 10b)...." In this regard, the Examiner confuses "solving" for a transfer function matrix with "computing" a transfer function matrix. The distinction is that the matrix in question in Fig. 10b is computed directly as the product of other matrices, for example, AB as the product of A and B. (For the present purposes, the same concepts apply here as in ordinary algebra.) On the other hand, an example of solving for a matrix would be in determining X in AX=B when A and B are known. Thus there is no "solving" for a matrix in the referenced parts of the Cooper '200 patent. In this regard, the usage of "solving" is consistent in this regard throughout the application.

Turning next to claims 11-13, and as background, the transfer functions *A* and *S* from Cooper '200 are "scalar" transfer functions, that is, normal transfer functions as typically studied by undergraduate electrical engineers in classes on circuits and systems. Examples are the transfer function from an input of a resistor-capacitor circuit to the output of the circuit, or from the input of a loudspeaker to the output of a microphone which is used in measurements. In contrast, collecting several scalar transfer functions into a matrix creates a matrix of transfer functions which are the types of matrices described in the specification, in which the actual matrix elemental values depend upon frequency. With *S* and *A* as defined, a transfer function matrix from a loudspeaker to the ears of a person, with *S* roughly meaning "same-side" and *A* meaning "alternate-side," becomes

$$\begin{bmatrix} S & A \\ A & S \end{bmatrix}$$

Examiner attempts to establish in part that the functions *A* and *S* could varied (indeed, *would* vary) depending on the placement of the first listener relative to the two loudspeakers, which part is correct. However, Examiner then attempts to further establish that "for additional listener(s), one skilled in the art would have expected that a different set of transfer functions *A* and *S* should be used depending on the location(s) of the additional listener(s)." The problem with this statement is the "(s)" attached to the ends of some of the words "listener" and "location." According to Cooper, using different transfer functions could indeed accommodate a listener in a number of different locations, but *only at one different location at a time*. Where the Examiner is mistaken is in thinking that Cooper teaches a general approach to layout reformatters whereby several listeners each in different locations can be simultaneously satisfied, "...the locations of the additional listeners" (parentheses removed). In fact, using the *A*-and-*S* approach, there is an exact solution when there is only one other listener; if two or more listeners are simultaneously present (Claim 11: "a plurality of other listeners"), then the teachings of the Cooper '200 patent become inadequate. It is the well-known case from high-school algebra in that there must be fewer variables (two speakers) than there are unknowns (four or more ears) in order to solve a set of linear equations. Only in the specification (and claimed invention) is this scenario addressed. Also, only in this specification is the scenario of having, for example a binaural

experience reconstructed for, say, two listeners (four ears) and four loudspeakers.

It is not a teaching of Cooper to create a layout reformatter for an arbitrary number of listeners based on the binaural perception of a single, first listener, or for that matter, any number of "first listeners."

With respect to claims 14-18, the teachings of Cooper are incomplete. With respect to "stereo input," it is hard to see how a device, Cooper '200 or any other device, anticipates the invention simply because it has a "stereo input." It that were the case, there could be no further inventions on any device which includes a stereo input.

A similar argument can be made with respect to "a plurality of speakers" and "crosstalk cancellation." The mere mention of these terms in a patent does not preclude their use in novel ways or to extend their functionality as in the present application, to teach extended methods that can handle, in principle, any number of "first space" speakers rather than only one or two, any number of "second space" speakers other than only two (or three in a degenerate configuration), any number of "second space" listeners other than only one, and so on.

Regarding claim 19, Cooper indeed shows the head simulation, Fig. 9, (and associated or implied crosstalk cancellation to make a complete speaker-based system), ostensibly qualifying as a "conceptual or simulated space." However, claim 19 depends on an independent claim which (according to the inventor) is not anticipated in the prior art, and should therefore be allowed.

With regard to claims 20 and 21, the Examiner is mistaken about the function of Fig. 15 of Cooper. Based on Examiner's discussion in this paragraph, Figs. 10a and 10b would

appear to be more appropriate. For purposes of addressing Examiner's remarks, it may be assumed that Fig. 15 is as the Examiner needs it to be, with one set of speakers in a first space at ±30° or ±50° and speakers in a second space at ±15°. This is the "speaker spreader" discussed at length in the Cooper '200 patent and other patents of Cooper and Bauck.

However, even with the above adjustments in referencing items in Cooper, Fig. 15 of the Cooper '200 patent still fails to teach or suggest the use of the third matrix, or that it must describe transfer functions "from more than three loudspeakers in the second space to the ears of the listener in the second space." Cooper is silent on how to design systems with more than three such speakers.

Claims 21 and 22 are dependent upon claim 20, (which as demonstrated above) is allowable. Since claim 20 is allowable, so to, are claims 21 and 22.

With regard to claim 23, the claimed sum or difference of two matrices in column 19, lines 3-5 do not exist. There are no matrix quantities in those lines. X_p and X_n are scalar, ordinary transfer functions.

With regard to claim 24, the Cooper '200 patent does show realizable and stable filter elements in Figs 6 and 7. In addition, Claim 24 is dependent upon claim 20, (which as demonstrated above) is allowable. Since claim 20 is allowable, so to, is claim 24.

Claim 26 is dependent upon claim 20, (which as demonstrated above) is allowable. Since claim 20 is allowable, so to, is claim 26.

With regard to claims 25 and 27-39, the Examiner appears to misunderstand Figure 18. The circumstances of Fig. 18 are that there is *one* listener in the first space, for example,

a person listening to ordinary two-channel stereo, midway between two speakers. With a contrived level of symmetry in the second space, that is, with three *evenly-spaced* speakers and two listeners each situated midway between each of two of the three speakers, literally as shown in Fig. 18. Each of the listeners hears the binaural impression of the first listener in the first space, *except that one listener must hear a reversed image where left is swapped with right.*

Cooper '200 shows only a method of recreating one acoustic perception of a single listener if a first space. This single acoustic perception is not recreated for more than one listener in a second space *because one listener must necessarily hear a reversed image.*

One skilled in the art could not "determine the set of second matrix of transfer function for each listener in the first space when more than one listeners are located in the first space" because there is only one listener in the first space, in Cooper. The Examiner's assertion, "Thus, ... by determine the second matrix of transfer functions for each listener among plurality of listeners in the first space..." similarly is based on a misunderstanding of the function of Fig. 18.

Claims 28-30 dependent upon claim 27, (which as demonstrated above) is allowable. Since claim 27 is allowable, so to, are claims 28-30.

4. Allowance of claims 11-30, as now presented, is believed to be in order and such action is earnestly solicited. Should the Examiner be of the opinion that a telephone conference would expedite prosecution of the subject application, he is

respectfully requested to telephone applicant's undersigned attorney.

Respectfully submitted,

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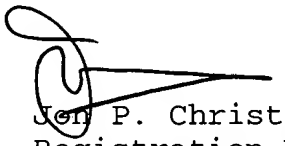
By 
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